

$$\textcircled{1} -x^2 + 4x - 7 = 0$$

$$\left. \begin{array}{l} a = -1 \\ b = 4 \\ c = -7 \end{array} \right\} x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(-1)(-7)}}{2(-1)} = \frac{1 \pm \sqrt{1 - 28}}{-2} =$$

$$= \frac{1 \pm \sqrt{-27}}{-2}$$

$$\rightarrow \left\{ \begin{array}{l} x_1 = -\frac{1 + \sqrt{-27}}{-2} \\ x_2 = -\frac{1 - \sqrt{27}}{-2} \end{array} \right.$$

$$\textcircled{2} 2x^2 + 4x = 30$$

$$2x^2 + 4x - 30 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \left\{ \begin{array}{l} a = 2 \\ b = 4 \\ c = -30 \end{array} \right.$$

$$x = \frac{-4 \pm \sqrt{4^2 - 4 \cdot 2 \cdot (-30)}}{2 \cdot 2} = \frac{-4 \pm \sqrt{16 + 240}}{4} =$$

$$= \frac{-4 \pm \sqrt{256}}{4} = \frac{-4 \pm 16}{4} \left\{ \begin{array}{l} \frac{-4 + 16}{4} = 3 \\ \frac{-4 - 16}{-4} = -5 \end{array} \right.$$

$$\boxed{\begin{array}{l} x_1 = 3 \\ x_2 = -5 \end{array}}$$

$$\textcircled{3} 4x^2 + 1 = -4x$$

$$4x^2 + 4x + 1 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad \left\{ \begin{array}{l} a = 4 \\ b = 4 \\ c = 1 \end{array} \right.$$

$$x = \frac{-4 \pm \sqrt{4^2 - 4 \cdot 4 \cdot 1}}{2 \cdot 4} = \frac{-4 \pm \sqrt{16 - 16}}{8} = \frac{-4 \pm 0}{8} \left\{ \begin{array}{l} \frac{-4 + 0}{8} \\ \frac{-4 - 0}{8} \end{array} \right.$$

$$\boxed{x_1 = x_2 = \frac{-4}{8} = -\frac{1}{2}}$$

$$\textcircled{4} \quad 3x^2 = 5x + 2$$

$$3x^2 - 5x - 2 = 0$$

$$\begin{cases} a = 3 \\ b = -5 \\ c = -2 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4 \cdot 3 \cdot (-2)}}{2 \cdot 3} = \frac{5 \pm \sqrt{25 + 24}}{6} =$$

$$= \frac{5 \pm \sqrt{49}}{6} = \frac{5 \pm 7}{6} \begin{cases} \frac{5+7}{6} = \frac{12}{6} = \underline{\underline{2}} \\ \frac{5-7}{6} = \frac{-2}{6} = \underline{\underline{-\frac{1}{3}}} \end{cases}$$

$$\boxed{\begin{matrix} x_1 = 2 \\ x_2 = -\frac{1}{3} \end{matrix}}$$

$$\textcircled{5} \quad (x+3)(x-5) = 0$$

FORMA 1

- Un producto de dos cosas que da \emptyset , entonces se cumple que, o bien la primera es \emptyset , o bien la segunda es \emptyset .

$$\begin{aligned} x+3 &= 0 \longrightarrow \boxed{x_1 = -3} \\ x-5 &= 0 \longrightarrow \boxed{x_2 = 5} \end{aligned}$$

FORMA 2

- Desarrollar el producto

$$x^2 - 5x + 3x - 15 = 0$$

$$x^2 - 2x - 15 = 0 \quad \begin{cases} a = 1 \\ b = -2 \\ c = -15 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot (-15)}}{2 \cdot 1}$$

$$x = \frac{2 \pm \sqrt{4 + 60}}{2} = \frac{2 \pm \sqrt{64}}{2}$$

$$x = \frac{2 \pm 8}{2} \begin{cases} \frac{2+8}{2} = \underline{\underline{5}} \\ \frac{2-8}{2} = \underline{\underline{-3}} \end{cases}$$

$$\textcircled{6} \quad (x+4)^2 = 0$$

FORMA 1

$$\sqrt{(x+4)^2} = \sqrt{0}$$

$$x+4 = 0$$

$$x = -4$$



$$\boxed{x_1 = x_2 = -4}$$

FORMA 2

• Igualdad notable

$$x^2 + 4^2 + 2 \cdot 4 \cdot x = 0$$

$$x^2 + 8x + 16 = 0 \quad \begin{cases} a=1 \\ b=8 \\ c=16 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-8 \pm \sqrt{8^2 - 4 \cdot 1 \cdot 16}}{2 \cdot 1}$$

$$x = \frac{-8 \pm \sqrt{64 - 64}}{2} = \frac{-8 \pm \sqrt{0}}{2}$$

$$x = \frac{-8}{2} \rightarrow \boxed{x_1 = x_2 = -4}$$

$$\textcircled{7} \quad (x-5)^2 - 9 = 0$$

$$\underbrace{x^2 + 5^2 - 2 \cdot 5 \cdot x}_{\text{igualdad notable}} - 9 = 0 \quad ; \quad x^2 + 25 - 10x - 9 = 0$$

$$x^2 - 10x + 16 = 0$$

$$\begin{cases} a=1 \\ b=-10 \\ c=16 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-10) \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 16}}{2 \cdot 1} =$$

$$= \frac{10 \pm \sqrt{100 - 64}}{2} = \frac{10 \pm \sqrt{36}}{2} = \frac{10 \pm 6}{2} \quad \begin{cases} \frac{10+6}{2} = \underline{\underline{8}} \\ \frac{10-6}{2} = \underline{\underline{2}} \end{cases}$$

$$\boxed{\begin{matrix} x_1 = 8 \\ x_2 = 2 \end{matrix}}$$

$$\textcircled{8} \quad 18 = 6x + x(x-13)$$

$$18 = 6x + x^2 - 13x$$

$$18 = x^2 - 7x$$

$$x^2 - 7x - 18 = 0 \quad \begin{cases} a = 1 \\ b = -7 \\ c = -18 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \cdot 1 \cdot (-18)}}{2 \cdot 1} =$$

$$= \frac{7 \pm \sqrt{49 + 72}}{2} = \frac{7 \pm \sqrt{121}}{2} = \frac{7 \pm 11}{2} \quad \begin{cases} \frac{7+11}{2} = \underline{\underline{9}} \\ \frac{7-11}{2} = \underline{\underline{-2}} \end{cases}$$

$$\boxed{\begin{matrix} x_1 = 9 \\ x_2 = -2 \end{matrix}}$$

$$\textcircled{9} \quad x^2 - \frac{7}{6}x + \frac{1}{3} = 0$$

• Quitar denominadores

$$\frac{6x^2}{6} - \frac{7x}{6} + \frac{2}{6} = \frac{0}{6}$$

$$6x^2 - 7x + 2 = 0 \longrightarrow \begin{cases} a = 6 \\ b = -7 \\ c = 2 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-7) \pm \sqrt{(-7)^2 - 4 \cdot 6 \cdot 2}}{2 \cdot 6} =$$

$$= \frac{7 \pm \sqrt{49 - 48}}{12} = \frac{-7 \pm 1}{12} \quad \begin{cases} \frac{-7+1}{12} = \frac{-6}{12} = \underline{\underline{-\frac{1}{2}}} \\ \frac{-7-1}{12} = \frac{-8}{12} = \underline{\underline{-\frac{2}{3}}} \end{cases}$$

$$\boxed{\begin{matrix} x_1 = -\frac{1}{2} \\ x_2 = -\frac{2}{3} \end{matrix}}$$

$$\textcircled{10} \quad x^2 + \frac{1}{2}x - \frac{1}{2} = 0 \quad |$$

$$\frac{2x^2}{2} + \frac{1x}{2} - \frac{1}{2} = \frac{0}{2}$$

$$2x^2 + x - 1 = 0 \quad \text{---} \quad \begin{cases} a = 2 \\ b = 1 \\ c = -1 \end{cases}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-1 \pm \sqrt{1^2 - 4 \cdot 2 \cdot (-1)}}{2 \cdot 2} =$$

$$= \frac{-1 \pm \sqrt{1+8}}{2 \cdot 2} = \frac{-1 \pm \sqrt{9}}{4} = \frac{-1 \pm 3}{4} \quad \begin{cases} \frac{-1+3}{4} = \frac{1}{2} \\ \frac{-1-3}{4} = -1 \end{cases}$$

$$\boxed{\begin{array}{l} x_1 = \frac{1}{2} \\ x_2 = -1 \end{array}}$$